5SDD 38H5000

Old part no. DV 889-3800-50

Rectifier Diode

Properties

- Industry standard housing
- Suitable for parallel operation
- High operating temperature
- Low forward voltage drop

Key Parameters

V_{RRM}	=	5 000	V
I_{FAVm}	=	3 814	A
I_{FSM}	=	45 000	A
V_{TO}	=	0.903	V
r_T	=	0.136	mΩ

Types

	V_{RRM}
5SDD 38H5000	**5 000 V**
Conditions:	*T_j = -40 ÷ 160 °C, half sine waveform, f = 50 Hz*

Mechanical Data

F_m	**Mounting force**	**50 ± 5 kN**
m	**Weight**	**0.9 kg**
D_S	**Surface creepage distance**	**40 mm**
D_a	**Air str ke distance**	**20 mm**

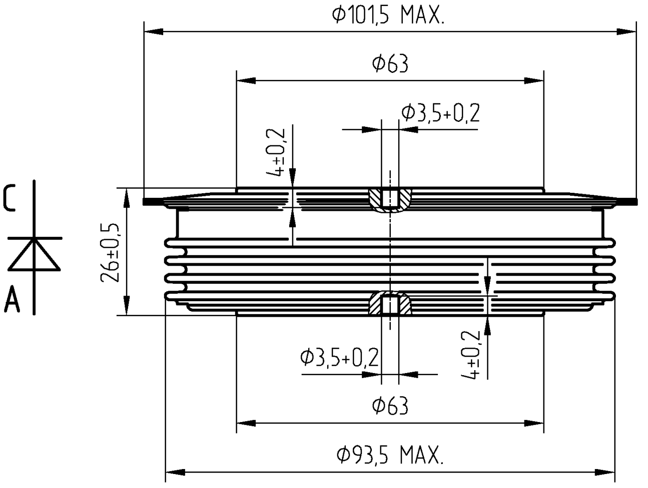

Fig. 1 Case

ABB s.r.o.
Novodvorska 1768/138a, 142 21 Praha 4, Czech Republic
tel.: +420 261 306 250, http://www.abb.com/semiconductors

Maximum Ratings			*Maximum Limits*	*Unit*
V_{RRM}	**Repetitive peak reverse voltage** T_j = -40 ÷ 160 °C		**5 000**	**V**
I_{FAVm}	**Average forward current** T_c = 85 °C		**3 814**	**A**
I_{FRMS}	**RMS forward current** T_c = 85 °C		**5 992**	**A**
I_{RRM}	**Repetitive reverse current** $V_R = V_{RRM}$		**110**	**mA**
I_{FSM}	**Non repetitive peak surge current** V_R = 0 V, half sine pulse	t_p = 8.3 ms	**48 070**	**A**
		t_p = 10 ms	**45 000**	**A**
I^2t	**Limiting load integral** V_R = 0 V, half sine pulse	t_p = 8.3 ms	**9 589 900**	**A^2s**
		t_p = 10 ms	**10 125 000**	**A^2s**
T_{jmin} -T_{jmax}	**Operating temperature range**		**-40 ÷ 160**	**°C**
T_{STG}	**Storage temperature range**		**-40 ÷ 160**	**°C**

Unless otherwise specified T_j = 160 °C

Characteristics		*Value*			*Unit*
		min	*typ*	*max*	
V_{T0}	**Threshold voltage**			**0.903**	**V**
r_T	**Forward slope resistance** I_{F1} = 5 969 A, I_{F2} = 17 907 A			**0.136**	**mΩ**
V_{FM}	**Maximum forward voltage** I_{FM} = 4 000 A			**1.430**	**V**
Q_{rr}	**Recovered charge** V_R = 100 V, I_{FM} = 2000 A, di_F/dt = -30 A/µs		**5 000**		**µC**

Unless otherwise specified T_j = 160 °C

Thermal Parameters			**Value**	**Unit**
R_{thjc}	**Thermal resistance junction to case**	*double side cooling*	**8.0**	**K/kW**
		anode side cooling	**14.5**	
		cathode side cooling	**18.0**	
R_{thch}	**Thermal resistance case to heatsink**	*double side cooling*	**2.5**	**K/kW**
		single side cooling	**5.0**	

Transient Thermal Impedance

Analytical function for transient thermal impedance

$$Z_{thjc} = \sum_{i=1}^{4} R_i (1 - \exp(-t / \tau_i))$$

Conditions:

F_m = 50 ± 5 kN, Double side cooled

Correction for periodic waveforms

180°	sine:	1.0	K/kW
120°	sine:	1.5	K/kW
60°	sine:	2.5	K/kW
180°	rectangular:	0.9	K/kW
120°	rectangular:	1.5	K/kW
60°	rectangular:	2.5	K/kW

i	1	2	3	4
τ_i (s)	0.4406	0.1045	0.0092	0.0022
R_i(K/kW)	4.533	2.255	0.868	0.345

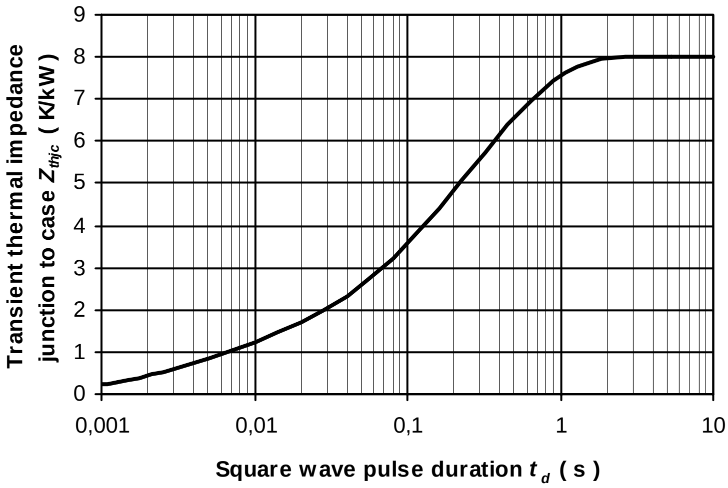

Fig. 2 Dependence transient thermal impedance junction to case on square pulse

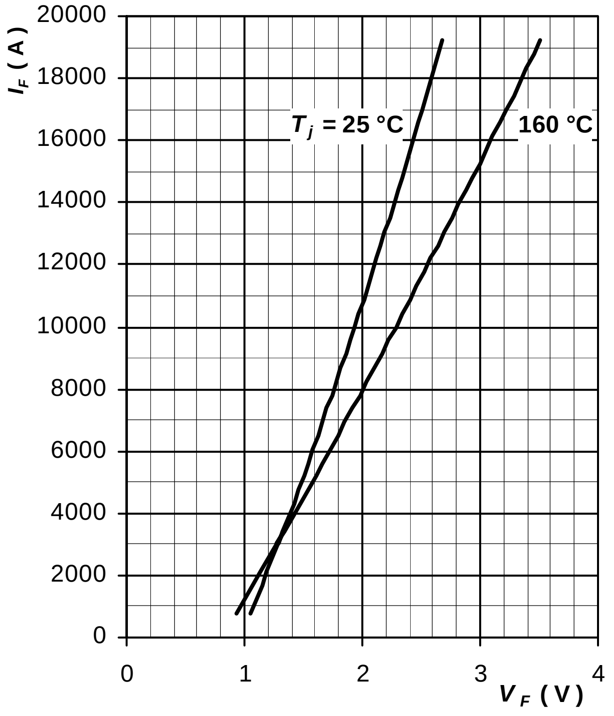

Fig. 3 Maximum forward voltage drop characteristics

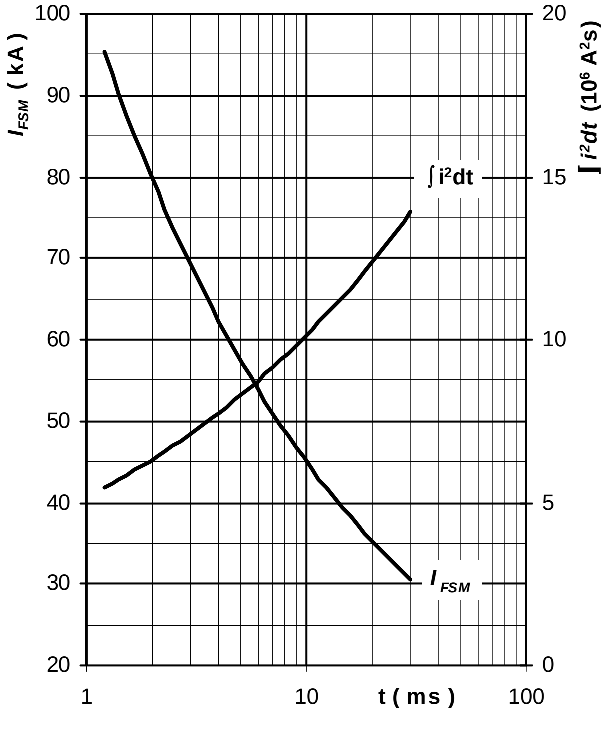

Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse, V_R = 0 V, $T_j = T_{jmax}$

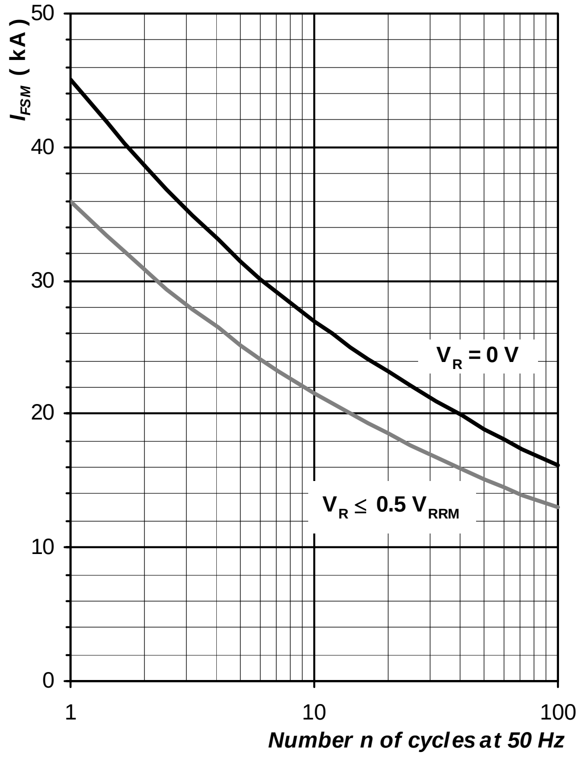

Fig. 5 Surge forward current vs. number of pulses, half sine wave, $T_j = T_{jmax}$

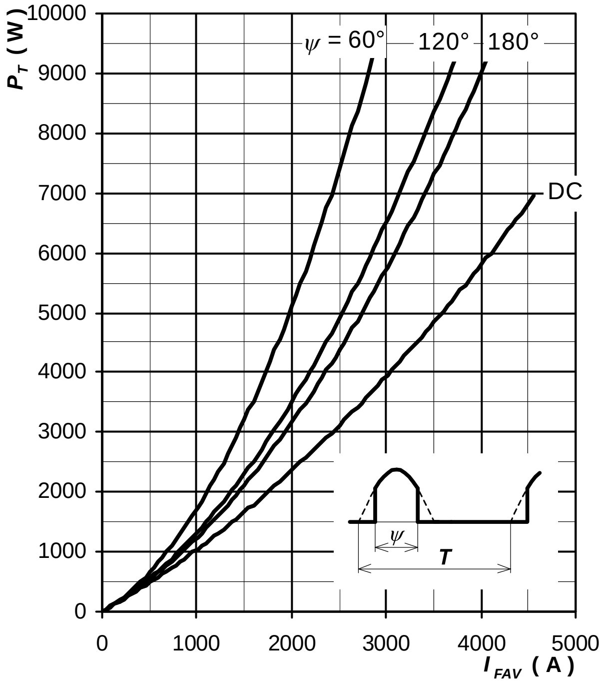

Fig. 6 Forward power loss vs. average forward current, sine waveform, f = 50 Hz, T = 1/f

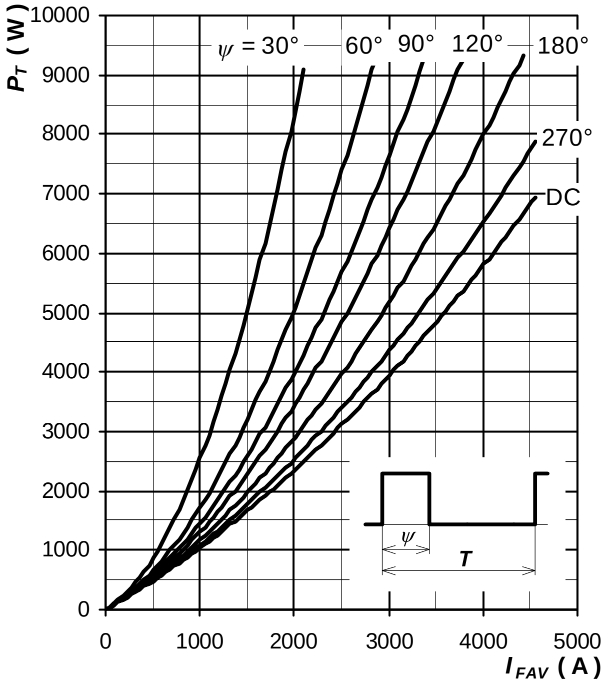

Fig. 7 Forward power loss vs. average forward current, square waveform, f = 50 Hz, T = 1/f

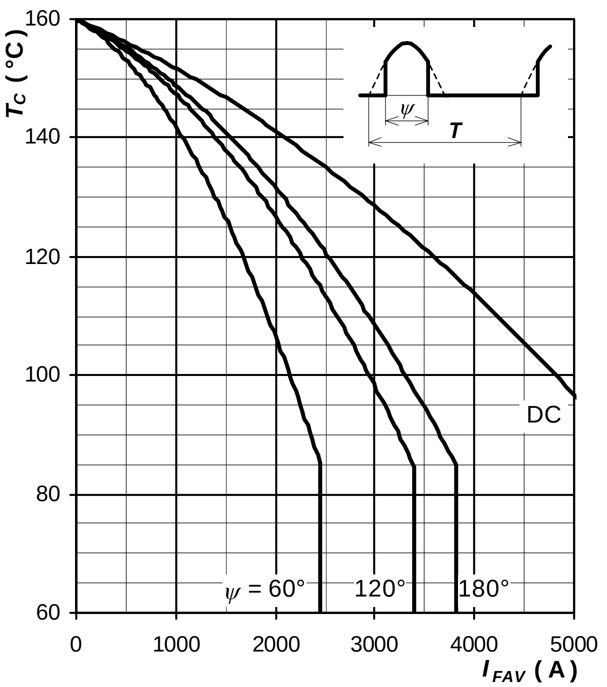

Fig. 8 Max. case temperature vs. aver. forward current, sine waveform, f = 50 Hz, T = 1/f

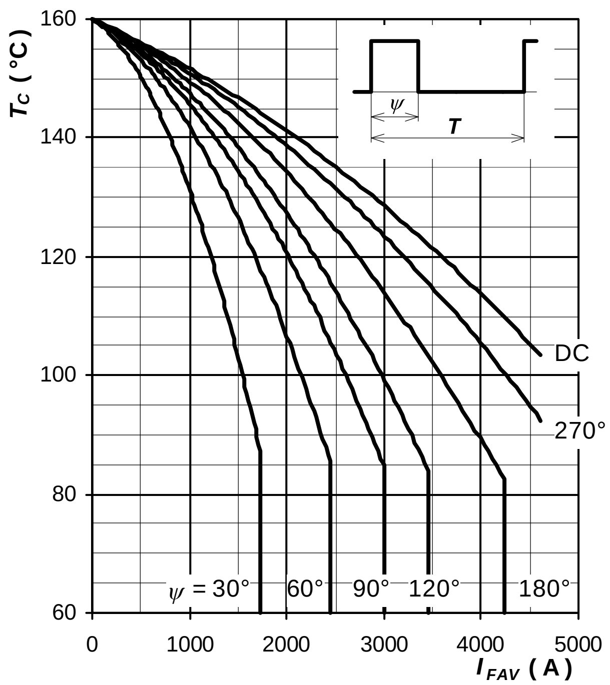

Fig. 9 Max.case temperature vs. aver. forward current, square waveform, f = 50 Hz, T = 1/f

Notes: